JAMECO
ELECTRONIC COMPONENTS
COMPUTER PRODUCTS

KIT ASSEMBLY INSTRUCTIONS

73613 (JE225) MULTI VOLTAGE POWER SUPPLY KIT

GENERAL DESCRIPTION:

The 73613 (JE225) is a single-board DC power supply providing a fixed 5V output and variable +/- outputs of up to 12V each. It is suitable for breadboard use or for incorporation into electronic devices requiring multiple voltages.

- Fixed output 5VDC at up to 500 mA continuous or 1A intermittent.
- Adj output, by board potentiometer, +3 to +12V at up to 100 mA.
- Adj output, by board potentiometer, -3 to -12V at up to 100 mA.
- Outputs fully transformer—isolated from power input.
- Built-in thermo-overload protection on all outputs.
- Three IC regulators with heat sink.
- Common output-return separable from power-ground for "floating" applications.
- Input, 105-125VAC, 60 Hz
- Size: 5.12" L x 5.12" W x 2.25" H

PARTS LIST:

Component Reference	Part Number	Product Description	Quantity
Q1	23579	I.C. Regulator, Pos Adj LM317T	1
Q2	23819	I.C. Regulator, Neg Adj LM337T	1
Q3	23667	I.C. 5V LM323K	1
C1,2,5,7	30533	Capacitor, Elec,Radial leads 2200MF, 25V	4
C3,4,6,8	33662	Capacitor, Tan. 1MF, 35V	4
CR1-4	35975	Diode, 1N4001	4
CR5	36249	Diode, 1N5401	1
LED1	34796	Display, XC556R	1
R1	29655	Resistor, ¼ W, 1K OHMs (BRN-BLK-RED)	1
R2,5	30251	Resistor, ¼ W, 180 OHMs (BRN-GRY-BRN)	2
R3,4	35502	Pot., Adj, CRL 2.5K	2
F1	25689	Fuse, ½ amp SLO/BLO	1
P1	38009	Power cord, 3 cond 17237	1
T1	29225	Transformer, P8130 or EQ	1
	42622	Heat sink, THM 6031	2
	43705	Heat sink, 690-T03	1
	76558	PC Board, JE 225-1	1
	76574	Fuse clip, Littlefuse 102074	2
	40969	Screw, PH 4-40 x ⅜"	2
	42446	Screw, PH 6-32 x ⅜"	10
	40977	Washer, LK #4	2
	42462	Washer, LK #6	10
	40942	Nut, Hex 4-40	2
	42420	Nut, Hex 6-32	16
	32011	Rubber feet, SJ5012 or EQ	4
	77913	Electrical tape ¾" W x 6" L	1
	76662	Kit assembly instructions for 73613 (JE225)	1

All above components may be purchased separately from Jameco using the 5-digit part number.

ASSEMBLY PREPARATION AND PROCEDURES:

1. Important: Identify all parts on parts list before proceeding.
2. Suggestion: Simulate board assembly by placing the components in their actual place on the picture assembly, then transfer components to the actual board during assembly.
3. Tools required:
   - Small soldering iron, 27W to 35W.
   - Resin core solder, .03" Dia. SN60 or SN63. Do not use acid core type or 50/50 solder.
   - Small sponge (water dampened) for cleaning solder tip.
   - Small wire cutter/stripper.
   - Small long nose plier.
   - Screw driver.
   - DC meter 0 to 18VDC range.

Component wire stripping, bending and lead spreading.

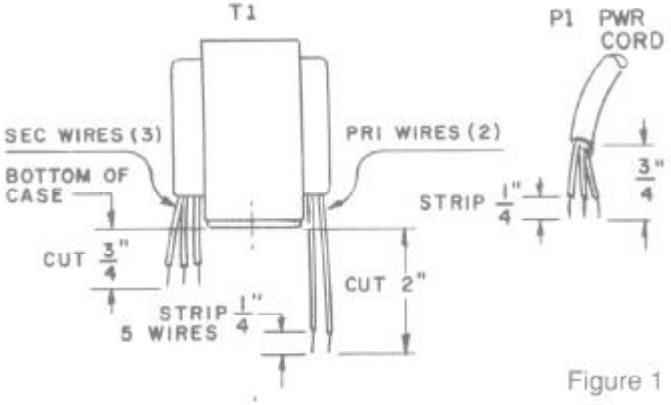
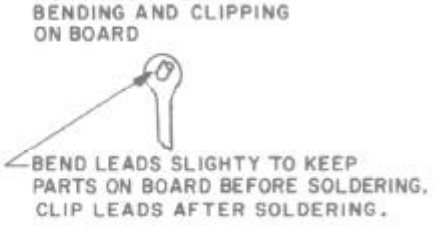


Figure 1


COMPONENT LEAD BENDING AND CLIPPING ON BOARD
BEND LEADS SLIGHTY TO KEEP PARTS ON BOARD BEFORE SOLDERING. CLIP LEADS AFTER SOLDERING.

73613 (JE225)
Multi Voltage Power Supply Kit

SOLDERING TIPS:

1. Feed the solder to the crack between the iron tip and the solder pad next to the component lead.
2. Leaving the iron tip too long on a pad will cause the pad to lift, as well as damage the component. Allow approx. 2 seconds per solder joint.
3. Using too much solder can cause the solder to bridge across traces and pads.
4. Keep iron tip clean by wiping the tip across a water dampened sponge —frequently.

ASSEMBLY INSTRUCTIONS:

READ ALL THE INSTRUCTIONS BEFORE STARTING.

1. Printed wiring board assembly. See assembly picture.
   - 1.1 Start the board assembly by placing the PW board to the position shown on the assembly picture. The etched foil on the board will be on the back side.
   - 1.2 Insert resistors R1, R2, and R5. Be sure that the color coded values are properly placed. Solder and clip leads.
   - 1.3 Insert diodes CR1 thru CR5 as shown. The polarity band on each of the diodes must be placed as shown on the assembly. Mount all diodes 1/8"above board. Solder and clip leads.
   - 1.4 Insert capacitors C3, C4, C6 and C8. Be sure that the (+) lead on each of the capacitors is placed correctly into the board. Solder and clip leads.
   - 1.5 Install transformer T1 by first inserting the 3 secondary leads (twisted) into the board. The CT lead is different in color in this group of 3 wires and must go into the hole marked "CT" on the board. Secure transformer with #6 hardware as shown. Lock washers are mounted under the hex nuts. Solder leads. Insert the 2 primary wire (twisted) into the board as shown. Solder and clip all 5 leads.
   - 1.6 Insert regulators Q1 and Q2 with its metal tal facing T1. Push leads about 1/16" into the board. Do not solder as yet. Be sure the correct IC is placed into the correct location.
   - 1.7 Install the heat sinks behind the Q1 and Q2 as shown. Push the heat sink tabs into the holes. Allow 1/16" air space between the bottom of the heat sink and the top of the board. Secure ICs to heat sink with No. 4 hardware as shown. Solder IC leads and clip leads as required.
   - 1.8 Insert capacitors C1, C2, C5 and C7. Be sure that the (+) lead on each of the capacitors is placed correctly into the board. Solder and clip leads.
   - 1.9 Insert light emitting diode LED1. Note that the flat surface is facing transformer T1. Adjust the bottom of the LED to approx. 1/2" above the board. Solder and clip leads.
   - 1.10 Insert adjustable resistors R3 and R4. All leads must first be straightened before installing. Mount resistor body flush on board with the plastic knobs facing the output terminals as shown. Solder.
   - 1.11 Install switch jumper wire SJW with the clipped leads from transformer T1 (as an option a switch may be wired in place of SWJ jumper wire). Solder and clip leads.
   - 1.12 Install fuse clips (2) flush on board. Solder.
   - 1.13 Insert fuse F1 into fuse clips.
   - 1.14 Install Q3 with heat sink as shown. Note that the 2 pins on Q3 are slightly off centered and will fit into the heat sink and board one way. Use #6 hardware to mount as shown with the lock washer under the hex nut. Solder and clip leads.
   - 1.15 Install the 6 output terminals with #6 hardware as shown. Place a split lock washer under the hex nut and tighten security. Finger tighten the second hex nut over the first.
   - 1.16 Install power cord P1. Insert wires (twisted) into board hole pads as follow: white wire into "W" pad, black wire into "B" pad and green wire into "G" pad. Be sure that there are no exposed/stranded bare wires on both sides of the board. Solder and clip wires close to board.
   - 1.17 Cover high voltage pads and traces with electrical tape on the solder side of the board as shown.
   - 1.18 Place bumper feet (4) as shown if corner mounting holes are not used. (See figure 2-screw terminal detail).

2. Final assembly check-out:
   Do not attempt to plug in the power cord until a final check has been made to verify the correctness of all assembled components. Components IC1 and IC2 will be permanently damaged if their placement is accidentally swapped and diodes CR1, CR2 and CR5 will blow if their polarity placement is reversed. Any of the eight capacitors will be damaged as well as blown out of its associated device(s) if the leads are not correctly placed. Make a careful visual check for bad solder joints or solder-bridges. Place a check (✓) in each of the circles for correctness on the assembly picture as you go over each component placement.

POWER SUPPLY VOLTAGE ADJUSTMENT:

1. The 73613 (JE225) power supply voltage can be varied by turning adjustable resistors R3 for positive supply and R4 for negative supply. Use a DC voltage meter for correct voltage setting.
2. For dual adjustable positive (or dual negative) outputs, reverse leads on one of the supplies. However when used in this manner, each of the load must be in separate use, i.e. not electrically connected together.

SAFETY NOTES:

1. Never use the power supply on metal surfaces.
2. Allow adequate air ventilation to cool.
3. Unplug power cord when not in use.

Printed Wiring Board Assembly

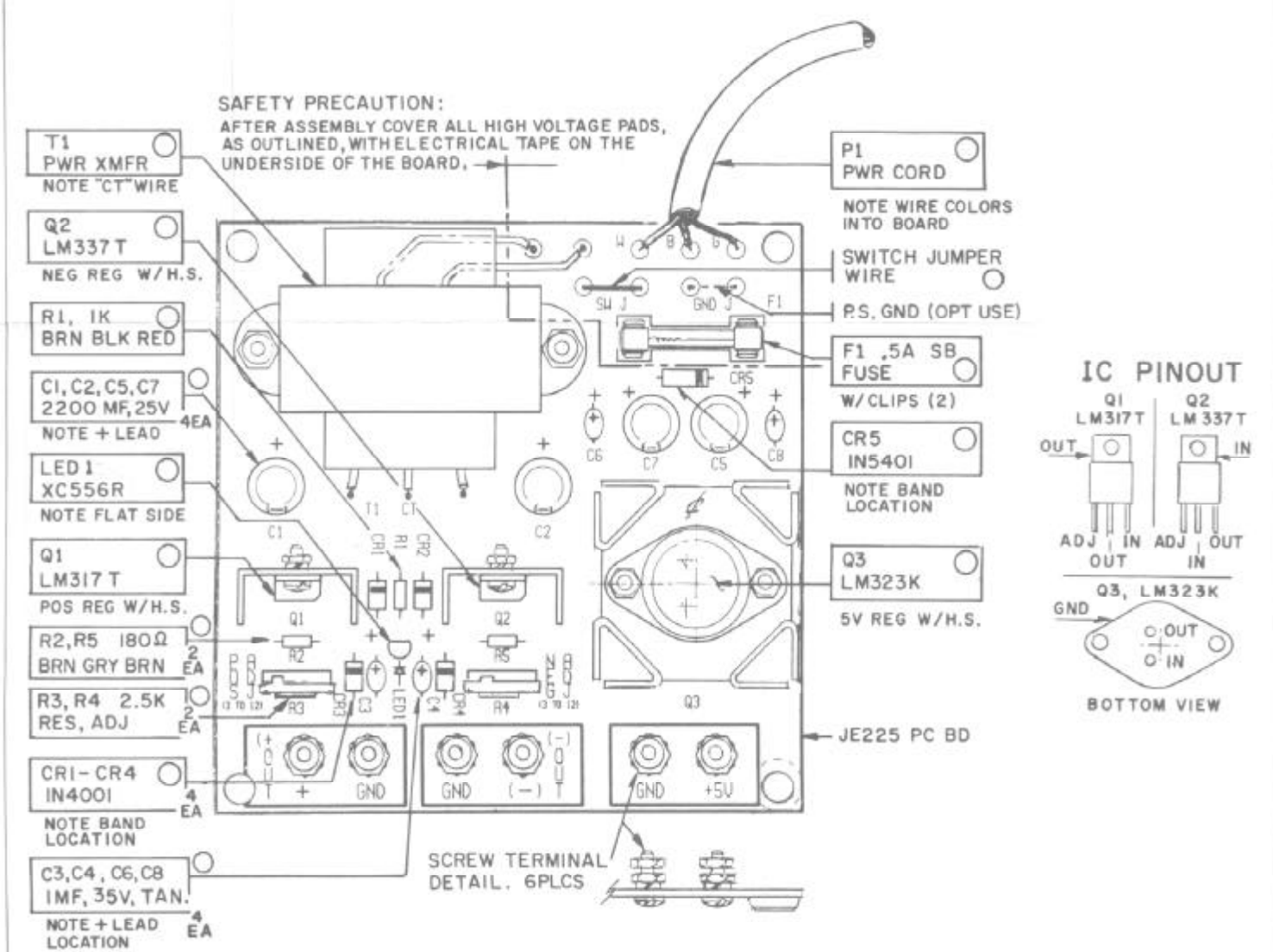
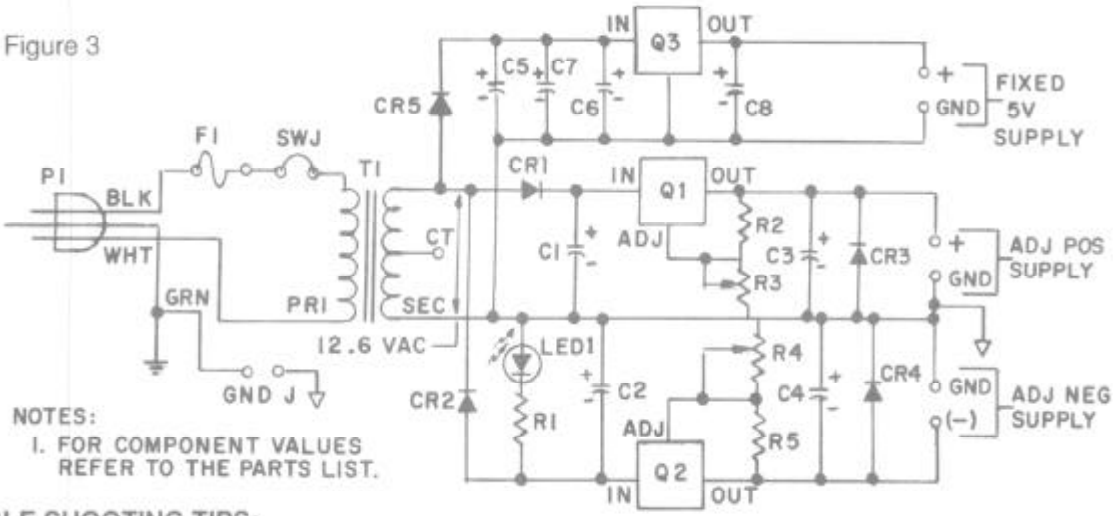


Figure 2

73613 (JE225) Power Supply Schematic Drawing

Figure 3



NOTES:
1. FOR COMPONENT VALUES REFER TO THE PARTS LIST.

TROUBLE SHOOTING TIPS:

1. No voltage output across supply terminals:
   - 1.1 A. Check power cord for correct wiring and 115 VAC on printed board pads. B. Check for 12.6VAC on secondary leads of transformer T1. C. Check for improper placement of C1, C2, C5 and C7 —should have approx 18.5VDC when measured across each of the capacitors. D. Diodes CR1, CR2 and CR5 will blow if polarity bands are placed backwards. Check for blown fuse F1 and placement of jumper wire SWJ.
     Suggestion: If severe problems result in blown fuses, you can temporarily connect a 75W, 115V light bulb in place of either jumper SWJ or fuse F1. The bulb will limit fault current until the fault can be fixed.
2. Everything functions except "LED1" which does not light:
   - 2.1 A. Reverse lead mounting.
3. Output voltage problems:
   - 3.1 Regulators IC1 and IC2 reversed. Possible permanent damage.
   - 3.2 A. Output voltage stays high; open connections in R3 and R4 terminals —check soldering. B. Output voltage stays low and doesn't change; shorted R3 and R4 terminals —check for solder bridging.
   - 3.3 Output varies and is difficult to adjust —check placement reversal of C3, C4, CR3 and CR4.
   - 3.4 No fixed 5V output —check for reversed mounting of CR5, C5 and C7.
   - 3.5 Mounting hardware not properly tightened.
4. If output voltage drops under load, check that load current is not excessive. With excess current drawn, a regulator will saturate on the 60Hz input peaks and output ripple will result, giving the indication of a drop in output voltage.

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Important Disclaimer: To the fullest extent permitted by applicable law, Jameco expressly disclaims the implied warranty of fitness for a particular purpose. Customer should understand that Jameco does not make any representation that products purchased will suit customer's particular purpose. Customer must rely on customer's own skill or judgement in selecting suitable products for customer. To the extent any implied warranty is applicable, such warranty shall be limited to 90 days from the date of purchase.

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